

Diesel Gelling

This guidance and information document has been compiled in the interest of Diesel consumers in South Africa by the South African Petroleum Industry Association (SAPIA) and the National Association of Automobile Manufacturers of South Africa (Naamsa).

1. WHAT HAPPENS WHEN DIESEL FUEL GELLS

Diesel fuel is a very complex mixture of hydrocarbons. As it cools down in cold weather, it does not “freeze” at a single temperature like water. Instead it turns cloudy as minute wax crystals begin to form in the fuel and eventually thickens like soft jelly. If cooled further, it becomes difficult to pump through the fuel system in your vehicle and in extremely low temperatures it could finally solidify. It is therefore important to be mindful of the lowest ambient temperatures in your area and what precautions must be taken to avoid problems associated with excessive diesel gelling

2. POTENTIAL PROBLEMS IN WINTER, ADVICE FOR ALL DIESEL USERS

Diesel consumers in the colder areas of South Africa, where the ambient temperature frequently drops to below -7°C for several hours, are often confronted with vehicles that do not want to start or perform unsatisfactorily when a sudden cold spell occurs during the winter months. What are these problems, their causes and what can be done to alleviate them?

3. THE DIFFERENCE BETWEEN WINTER AND SUMMER GRADE DIESEL FUELS

Summer and winter grade Diesel fuels differ in their low temperature gel formation characteristics. Winter grade Diesel normally contains a specialised additive to enable the Diesel to be used at lower ambient temperatures without gelling problems. The Cold Filter Plugging Point (CFPP) is the lowest temperature at which the fuel is liquid enough to pass through a test filter under standard conditions. The SANS (South African National Standards) specifications requires summer grade Diesel to have a CFPP of maximum $+3^{\circ}\text{C}$ and for the winter grade Diesel fuel a CFPP of maximum -4°C .

In certain particularly cold areas additional additive dosing is added to Diesel fuel. This is intended to lower the CFPP to -7°C . (See pages 3 and 4 for a listing of applicable magisterial districts.)

For South Africa, the winter grade Diesel fuel is distributed from 1 April to 30 September.

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4. PREPARATION FOR WINTER

Simple precautions can be taken by the consumer before the onset of the cold weather in order to reduce the risk of problems being experienced with Diesel fuel during winter months.

5. PREVENTATIVE MEASURES

5.1. STORAGE

Large volume storage tanks should either be installed underground or erected in a position sheltered from the wind. Do not buy large quantities of summer Diesel and store that for use in winter periods.

Prior to winter check and clean storage tank for both sludge and moisture.

Care should be taken to keep tanks near the design maximum capacity to minimise “breathing”, as the fuel expands and contracts moisture and dust may be drawn into the tank, this should be minimised.

5.2. MIXING OF WINTER AND SUMMER GRADE DIESEL

Ensure that summer grade Diesel fuel is run down to a minimum stock level in good time before ordering winter grade Diesel fuel. If several tanks are used for storage of Diesel fuel, use them in rotation rather than keeping one as a reserve.

5.3. VEHICLES

Remember that gelling is a temperature related phenomena.

- Ensure that vehicles are parked in a sheltered position overnight.
- Keep the fuel tank full as large volumes are less susceptible to ambient temperature fluctuations and hence gelling.
- Avoid re-fuelling Diesel vehicles in “warm” areas and then overnighting or passing through colder regions. Rather refuel in the “cold” region.
- Under extreme conditions, the vehicle may not start at all. Delay departure until later in the morning.
- In some instances, the vehicle will start but not perform satisfactorily. Allow the vehicle to idle and build up heat in the fuel tank through circulation of hot fuel from the engine back to the fuel tank.
- Ensure that vehicles have clean fuel filters (well serviced) as wax crystals tend to block easily filters that are already dirty.

Also remember not to use open flames to heat fuel systems

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6. CONTACTS

Should you experience cold start problems, please report this to the respective Oil Company where you refuelled or purchased your Diesel fuel or contact your vehicle dealership.

The following is a listing of Magisterial Districts for which additional Cold Flow protection is generally applied for winter Diesel fuel.

Magisterial District

1 ALIWAL NORTH	45 LINDLEY
2 BARKLY EAST	46 MARQUARD
3 BERGVILLE	47 MATATIELE
4 BETHLEHEM	48 MIDDELBURG (CAPE)
5 BETHULIE	49 MOLTENO
6 BLOEMFONTEIN	50 MOUNT FLETCHER
7 BLOEMHOF	51 MURRAYSBURG
8 BOSHOF	52 NOUPOORT
9 BOTHAVILLE	53 ODENDAALSRUS
10 BRANDFORT	54 PARYS
11 BULTFONTEIN	55 PETRUSBURG
12 CHRISTIANA	56 PHILIPSTOWN
13 CLOCOLAN	57 POTCHEFSTROOM
14 COFIMVABA	58 QUEENSTOWN
15 COLESBERG	59 REDDERSBURG
16 CRADOCK	60 REITZ
17 DEWETSDORP	61 RICHMOND (CAPE)
18 EDENBURG	62 ROUXVILLE
19 ELLIOT	63 SASOLBURG
20 ESTCOURT	64 SCHWEIZER-RENEKE
21 EXCELSIOR	65 SENEKAL
22 FAURESMITH	66 SMITHFIELD
23 FICKSBURG	67 STERKSTROOM
24 FOURIESBURG	68 STEYNSBURG
25 FRANKFORT	69 TAUNG
26 GRAAFF REINETT	70 THABA'NCHU
27 HANOVER	71 THEUNISSEN
28 HARRISMITH	72 TROMPSBURG
29 HARTSWATER	73 UNDERBERG
30 HEILBRON	74 VENTERSBURG
31 HENNENMAN	75 VENTERSTAD
32 HOFMEYR	76 VEREENIGING
33 HOOPSTAD	77 VILJOENSKROON
34 HOPETOWN	78 VIRGINIA
35 INDWE	79 VREDEFORT
36 JACOBSDAL	80 WARRENTON

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37 JAGERSFONTEIN
38 KIMBERLEY
39 KLERKSDORP
40 KOFFIEFONTEIN
41 KOPPIES
42 KROONSTAD
43 LADY GREY
44 LADYBRAND

81 WELKOM
82 WEPENER
83 WESSELSBRON
84 WINBURG
85 WOLMARANSTAD
86 XALANGA
87 ZASTRON